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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,841	10/22/2003	Olivier Briot	P08025US01/RFH	4232

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EXAMINER

HITESHEW, FELISA CARLA

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 02/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/689,841

Applicant(s)

BRIOT ET AL.

Examiner

Felisa C. Hiteshew

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Information Disclosure Statement

The PTOL 1449 has been received, reviewed and considered.

Claim Rejections - 35 USC § 112

1. Claim 2 recites the limitation "growth temperature" in line 1. There is insufficient antecedent basis for this limitation in the claim. Please insert the word "- a- - before the word for proper antecedence.
2. Claim 3 recites the limitation "Galium Nitride" and "Aluminum Nitride" in line 2. There is insufficient antecedent basis for this limitation in the claim. Please insert the word "- a- - before the word for proper antecedence.
3. Claim 6 recites the limitation "molar ratio..." in line1. There is insufficient antecedent basis for this limitation in the claim. Please insert the word "- a- - before the word for proper antecedence.
4. Claim 7 is being considered vague and indefinite in the use of the terminology "and/or". See *Ex Parte Anderegg* 51 USPQ 66.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Briot, et al reference entitled "Indium nitride quantum dots grown by metalorganic vapor phase epitaxy".


Briot, et al teaches producing indium nitride quantum dots by metalorganic vapor phase epitaxy, wherein nanometer-sized InN dots can be grown reproducibly onto GaN with excellent material quality and densities below 10^8 cm^{-2} . A 1 μm GaN buffer layer was grown by MOVPE on top which InN was deposited, using TMI_n and NH₃ (ammonia) precursors. In order to easily assess the material quality, "large" islands, using a depositing time of 3600 s. was utilized. The first key parameter is the growth temperature T_g. InN is known to have a quite low decomposition temperature, in the range of 550°C at equilibrium as compared to other nitrides. A high growth temperature was used to obtain a high crystalline quality and a low surface density of dots, since desorption and surface mobility was favored in its growth conditions. Figure 1 shows the morphology of quantum dots (i.e. size 500 nm), as seen by scanning electron microscopy. Briot, et al teaches that low growth temperature (500°C) leads to the deposition of indium droplets, while high (650°C) temperature produces remarkably degraded material. The dot shapes and densities versus growth temperature were

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determined by used atomic force microscopy (AFM), wherein the average dot diameter and density are plotted. The diameter/height ratio is typically around 10, and this "flat" geometry clearly originates from the fact that under these growth conditions, surface diffusion is high. The dot densities are extremely low, reaching 10^8 cm^{-2} for the optimum growth temperature of 625°C , which is important for the realization of single-photon emitters.

Briot, et al does not exactly teach wherein the molar ratio of ammonia and TMIn is above 7150. However, in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art to modify and optimize the process parameter limitation is order to ensure proper orientation. The motivation being that high quality InN dots with nanometer scale can reproducibly be grown onto GaN buffers by MOVPE. The growth temperatures can be adjusted between 550°C and 625°C to control the dot size and density.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill might reasonably infer from the teachings. In re Opprect 12 USPQ 2d 1235, 1236 (CAFC 1989); In re Bode 193 USPQ 12; In re Lamberti 192 USPQ 278; In re Bozek 163 USPQ 545, 549 (CCPA 1969); In re Van Mater 144 USPQ 421; In re Jacoby 135 USPQ 317; In re LeGrice 133 USPQ 365; In re Preda 159 USPQ 342 (CCPA 1968).


FELISA HITESHEW
PRIMARY EXAMINER
